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NTROL METHODS FOR INSECTS INJURIOUS TO THE PEACH

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FOREWORD

This circular is intended to give the necessary information for the co of the most destructive insect enemies of the peach.

Tack the spraying schedule where you can readily refer to it. Follo schedule closely and you will surely be gratified by the results. More det information may be secured by writing to the State Department of Agricul Raleigh, N. C.

TROL METHODS FOR INSECTS INJURIOUS TO THE PEACH

By W. B. Mabee, *Extension Entomologist*

THE SAN JOSE SCALE

fose Scale is prevalent throughout the state. It is an insect that is not y ecognized by the casual observer, and its injury, although very serious, o striking in appearance. It is a serious pest of nurseries and young a is, as when the infestation is heavy a young tree will be killed in from four years. In older trees it so takes the nourishment that the yield of s greatly reduced and the trees weakened, thus making them more ible to other diseases and pests. In severe cases the scale will settle h fruit, causing a reddish discoloration, often causing a shrinkage or ity at the places attacked.

insect has the appearance of a scale as indicated by its name. It is nd inconspicuous, being about the size of the head of a pin, round and ray in appearance. A tree that is heavily infested is likely to have an thy appearance and look as though sprinkled with fine ashes.

Control Measures—Winter Spraying

der to secure the best control it is necessary to spray during the winter s, because if a spray of sufficient strength to kill scale insects is used other time it will burn the fruit and foliage. If this concentrated is applied late (i. e., just before the buds are due to swell in the) it will help to control the peach leaf curl and the peach twig borer. Spray Schedule, page 4.)

THE CONTROL OF THE CURCULIO

curculio, the parent of the common "white worm" found in peaches, of the most destructive enemies of peaches in North Carolina.

control, however, is not particularly difficult if sufficient care and pre- ns are taken. "Slip-shod" methods will prove very disappointing.

s known that the adult curculio spends the winter—hibernates—in the and grass in or around the orchard, or in the neighboring woods. Thus it be advisable to clean up and burn the trash in and around the orchard, s way destroying many of the adults that would emerge in the spring. known that the curculio after emerging in the spring feeds some on the buds, but to a much greater extent feeds on and "stings" (lay eggs in) oung fruit, many of which drop to the ground. Therefore, the principal ol measures are based on poisoning and picking up and destroying the s."

ch of the fruit that has been "stung" by the curculio drops to the ground. is fruit, the worm (young curculio larva) develops, then enters the d to pupate and later emerge as an adult curculio ready to "sting" the oping fruit still remaining on the trees. Therefore it is important and elp greatly to pick up and DESTROY the "drops" twice a week EARLY e season; later it is not as effective.

the spray schedule on page 4 the addition of arsenate of lead to sprays 2, 3 and 4, is particularly for the control of the curculio. These sprays thoroughly and carefully applied should give satisfactory control. How- strict attention must be paid to the time of application and to thorough- of application.

SPRAY SCHEDU

No.	Time of Application	Spray Material to Use
1	Winter Spray	Winter Spray Home-made lime-sulphur 15-15-5(Standard Commercial Lime Sulp 1 gal. to 8 of water. See direction for making below.
2	A week after petals fall.	Summer Spray Home-made self-boiled lime-sulp 8-8-50 add 1 lb. arsenate of lead See directions for making next p
3	Two weeks later.	Same as No. 2.
4	About 1 month before due to ripen.	Same as No. 2, with only ½ to arsenate of lead.

Often in spray No. 2 the lime sulphur is omitted, adding only the pound of arsenate of lead to the barrel of water and using milk of lime marker and to prevent any burning of foliage. It is made by slaking t or four pounds of rock lime and adding to every barrel of spray. It i added precaution, however, to use the lime sulphur, as it will help in control of fungus diseases and especially peach leaf curl.

WINTER SPRAY

Directions for making lime-sulphur for winter spraying.—This home-m spray is very inexpensive and certainly is not difficult to make:

12 pounds of stone lime (unslaked).
15 pounds of sulphur (powdered).
50 gallons (1 barrel) of water.

Heat from 4 to 6 gallons of water to boiling over a fire in a large iro brass kettle. Mix the 15 pounds of sulphur with enough hot water to ma thin paste and pour it into the kettle of hot water. Now add the lime pa a time and as it slakes add a little cold water from time to time as need keep it from boiling over or becoming dry. Keep the fire going and sti mixture frequently. As the slaking ceases, keep it boiling from the fir half an hour longer, then add water to make 50 gallons (1 barrel). S through a fine wire screen or cloth to remove all sediment and the sol is ready to use.

PEACHES

Pests Controlled	Remarks
Jose Scale and other scale ts. Peach leaf curl.	Applied during the winter when there is no foliage or fruit on the trees. Important in the control of peach leaf curl.
ulio, h Leaf Curl,	Should be given when about ⅔ of the young peach is free from the "shuck" of the bloom.
ulio.	Important in the control of the Brown Rot.
	Needed for Belle of Georgia, Elberta, and varieties that ripen later than these. Important for control of Brown Rot.

SUMMER SPRAY

irections for making self-boiled lime sulphur for summer spraying.—This he material to use on peaches in all treatments when there is fruit or age on the trees:

8 pounds of stone lime (unslaked).
8 pounds of sulphur (powdered).
1 pound arsenate of lead.
50 gallons (1 barrel) of water.

The slaking lime does the boiling, no fire being necessary in boiling the sh itself, though hot water is used in slaking the lime.

Place the 8 pounds of lime in a tub or barrel and pour over it enough hot ter to cover it, put in the 8 pounds of sulphur (free from lumps) and add other bucket of water. As the mass boils from the slaking of the lime, it. Add more hot water as needed to form a thick paste at first, then dually a thin paste. When boiling is all over add water, cold is all right, make 50 gallons (1 barrel). Stir thoroughly and strain carefully. Dissolve one pound of arsenate of lead in enough of the solution to make a thin ste, then stir it into the whole solution and you are ready to spray.

Care should be taken in preparing this mixture not to allow too vigorous ling, but cool off with cold water before overheating occurs, which is indi- ted by the appearance of red streaks. Care should also be taken not to derheat or drown the slaking of the lime by adding too much water.

THE CONTROL OF THE FRUIT TREE BARK BEETLE

If some of the limbs of your peach trees look as though they had b struck with a charge of fine shot, it would probably indicate that they w being injured by the fruit tree bark beetle. Usually sap or gum may seen exuding from the fine holes. The holes are caused by the exit of small adult beetles and by their later entrance to lay eggs. The young larva burrow beneath the bark. About a month is required for each gene tion, there probably being about three generations a season in North Caroli

It will be observed that the injury occurs on trees that are in an unheal condition due to scale, borer or some other condition.

Knowing that these insects prefer sickly trees, our most important fa in control is to keep the trees in a vigorous and healthy condition by pro fertilization, cultivation, and keeping them free from disease and other inj by a well carried out spraying schedule.

Keep all the dead and diseased wood pruned out and burned. If the orch is well pruned, vigorous and healthy, little or no injury will be noticed f the fruit tree bark beetle.

Where trees are badly infested and immediate measures are necess trees of stone fruits like peach, plum and cherry may often be saved by prompt application of remedies. The trees should be first cut back sever and fertilized and cultivated liberally. This will stimulate the growth help the tree in overcoming the injury. A thick coat of whitewash can t be applied to the trunk and larger limbs. It will stick better if a handfu table salt is added to each bucketful. This should be applied at least t times during the season: once in early spring, in mid-summer, and in the

This whitewash will not kill the insects already in the trees, but if i thoroughly done, it will in a large measure prevent additional eggs being l and will help the trees, with the aid of cultivation and fertilizer, to r speedily recover from the injury.

CONTROL OF THE PEACH TREE BORER BY USE OF PARA-DICHLOROBENZENE

Until recently "worming" was the only means of controlling the peach borer, and every one who is familiar with this slow, tedious process will ap ciate a new method which has proven more satisfactory in control and expensive, as well as eliminating the great amount of labor involved worming.

E. B. Blakeslee, of the United States Bureau of Entomology, complete series of investigations on the use of several gases to control the peach borer. Of the materials he used, para-dichlorobenzene was proven to be most satisfactory, giving about 94 per cent control when carefully used. use of this material as described and recommended by Mr. Blakeslee is s marized as follows:

The Material

The material to use is para-dichlorobenzene, a crystaline solid or pow If it cannot be procured from your local dealer it can be supplied from

The Rochester Germacide Co., Rochester, N. Y.;

The Hooker Electric Chemical Co., 25 Pine St., N. Y.;

The Niagara Sprayer Co., Middleport, N. Y.

How it is Applied

Pulverize to about the fineness of coarse salt or granulated sugar. surface of the soil around the trunk should be disturbed to break the c not more than one or two inches deep. As the gas given off by this chem

out five times heavier than air, it is only effective below the point of cation, so the earth should *not* be *dug away* from the base of the tree. *ssive amounts of gummy exudations should be removed* at the surface. required dose of ¾ to 1 ounce is sprinkled on the ground around the not more than two inches from the trunk, nor closer than one inch to the k. Shovels full of earth are then piled and mounded slightly around the of the trunk, so as to hold the fumes as they develop. Pack the earth- ad firmly with back of shovel.

ne base of the tree should be uncovered four to six weeks after the applica- and may be covered again a few days later.

The Amount to Use

ne amount to use would perhaps vary slightly according to the size of the . For trees six years and older, a dose of ¾ to 1 ounce gives very satis- ory results. For trees four to five years of age, ½ to ¾ ounce is sufficient. ctice should soon enable you to dip out the required amount without ghing each dose.

O NOT TREAT TREES LESS THAN FIVE YEARS OLD, AND DO T USE A GREATER AMOUNT OF PARA-DICHLOROBENZENE THAN COMMENDED, AS YOU WOULD LIKELY INJURE THE TREES.

The Cost

he material can be secured in small quantities for 40 cents a pound and in ge quantities it would be much cheaper.

When to Use

his treatment is most effective in North Carolina when done from Septem- 25 to October 10, as the majority of the eggs of the borer have hatched l maximum control will be secured. However, the material is always ective, and if it is applied at any other time than during the cold months, le or no injury to the tree will be experienced and good control secured. This method is new and occasional disappointments may occur, but it is nple and promises a great saving from the old hand-worming process.

SUGGESTIONS

Be Particular About Your Spraying

Spraying of fruit trees is no longer considered an experiment. It is a cessity; an insurance against possible outbreaks of destructive insects and seases. The man who does not spray finds himself handicapped when com- ting with up-to-date orchardists. He does not secure the increased pro- iction that healthy trees free from disease and parasites can give, and rthermore he cannot secure the percentage of first-class fruit which spray- g insures. Fruit with blemishes, scabs and disease spots cannot bring a od price.

A complete spraying program when carefully and thoroughly carried out as proven that it will bring immense returns on the investment of expense, me and labor. No halfway or slipshod methods can be depended upon to roduce satisfactory results. It is well to remember that spraying has cumu- tive effects and in a series of years better results will accrue each year from bor and expense involved.

It is well to remember that North Carolina has a long growing season, with arm summer temperatures and plenty of moisture. This tends to increase lant diseases and insect life, more than do the climatic conditions of many

other states. These conditions make it more imperative that spraying sh be carried on more thoroughly and carefully than in some of the other f growing sections.

1. DON'T WAIT UNTIL TIME TO SPRAY BEFORE YOU ASSEMB YOUR MATERIALS AND YOUR TOOLS. THE CHANCES ARE TE SOME LITTLE THING WILL BE MISSING THEN OR YOU WILL BE O OF SOME CHEMICAL AND CANNOT PROCURE IT FROM YOUR LOC DEALER, SO YOU WILL BE OBLIGED TO WAIT SEVERAL DAYS PROCURE IT, THUS MISSING THE PROPER TIME TO SPRAY. O YOUR SPRAYER IN PLENTY OF TIME TO LOOK IT OVER AND SURE THAT IT WORKS AND THAT NECESSARY PARTS HAVE BE REPAIRED OR REPLACED. HAVE A SUFFICIENT QUANTITY MATERIAL ON HAND SO AS TO BE READY WHEN THE TIME COM

2. Don't try other combinations of spray chemicals without consulting authority. It may result in being of no benefit and even defoliate the tr

3. Don't try to dilute the solutions or to strengthen them, other than sh in spray calendar (page 4) for their proportions have been determined experts. There are sufficient materials used to make the sprays most effect so diluting materials with the object in view of making them cheaper will yield maximum results.

4. Don't try leaving out one spray because you think you can get by. chances are that you will not get by, thus lessening the benefits of previous as well as those of subsequent sprays.

5. Don't put off spraying on account of other work. Spraying cannot and still retain maximum effectiveness.

6. Don't think that spraying requires a great amount of technical knowle It does not. Any one can spray properly by merely being careful to follow directions.

7. Don't think that spraying is dangerous because some of the ingredi are poisonous. A little care in disposing of unused chemicals will elimi the danger. The poison is eventually washed off the fruit and foliage rains and thus obviates danger to persons or stock.

8. Don't think that proper spraying requires time and expense out of portion to the benefits derived. Until you have tried you will not realize much it improves the yield and quality of the crop.

9. Don't fail to get that spraying outfit now. You can use it not onl spray your orchard now and for years to come, but also to spray potat tomatoes, cabbages and various other garden and field crops, thus increa your production. A spray pump is also efficient to use in whitewashing houses, buildings, and the like.

10. Don't think that all these things do not apply to you. If you are experienced orchardist you know the true value of this advice, and if you not you should try spraying and be personally convinced of its real value.